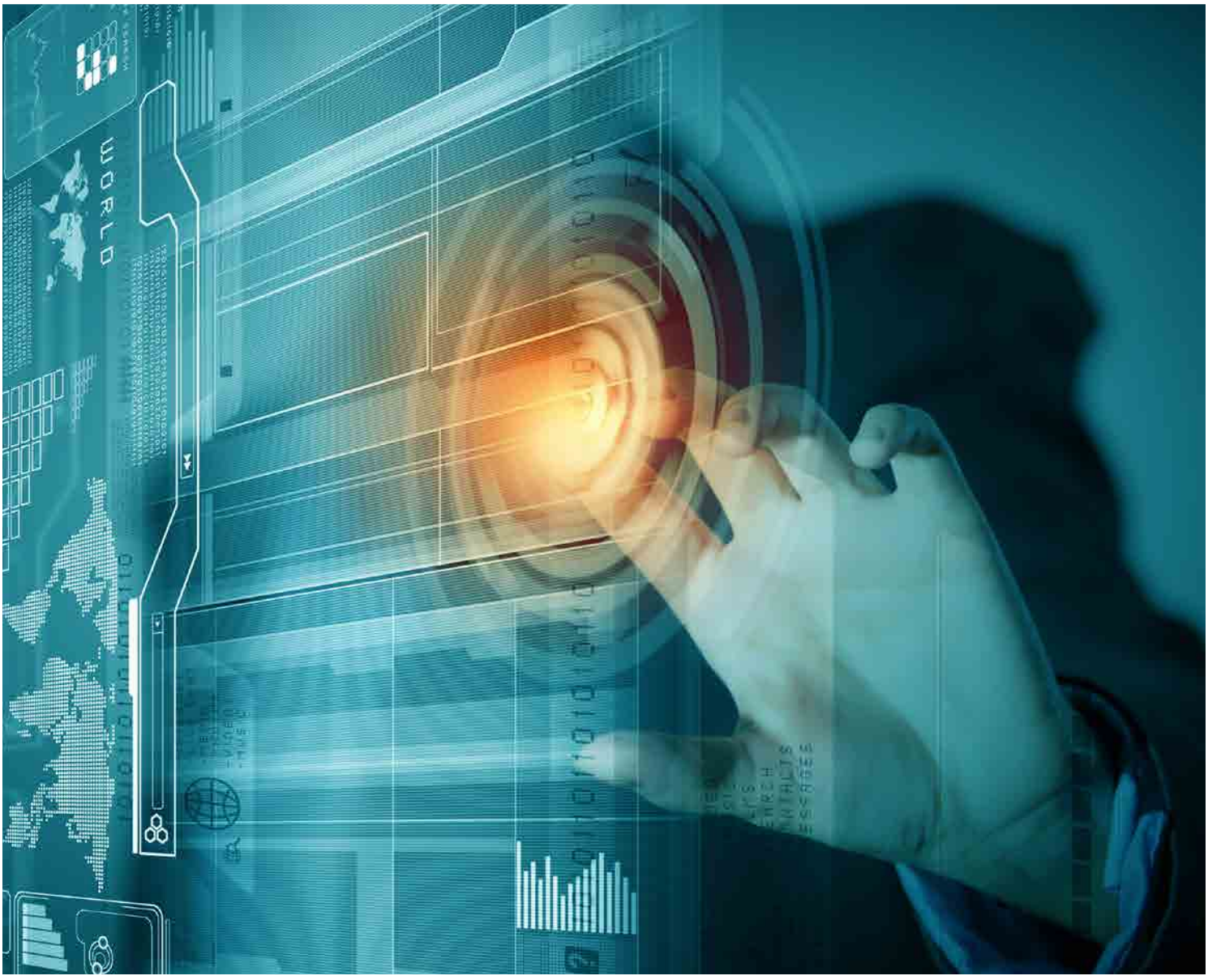
Strategic Reserve

User Guide



Disclaimer: This document has no legal value and is established with the purpose to help Grid Users to deal with the Strategic Reserve. This document should always be aligned with the two following documents: the "Functioning Rules of strategic reserves" and the "Procedure for Constitution of strategic reserves". In case of mismatches, the Functioning Rules prevail and are to be considered as valid reference. Please note that some of the published data are more recently updated than others. The accuracy is variable from data to data. Please always look attentively to the hypotheses taken when interpreting any published data.

Introduction

This document explains where an ARP or any other market party can find on the Elia website the necessary information related to the strategic reserve (SR) mechanism. Please pay attention that the content of this document is intended for persons with an advanced knowledge on the subject; basic information is not always explained, but can notably be found in the SR fact sheet[1] or the SR product sheet. The main assumptions taken are systematically stated and it is explained how the data should be understood.

The document is divided in three sections: "Anticipation", "Getting ready" and "Real-time Management". This should help ARPs in any potential activation of the strategic reserve.

- The "Anticipation" section gathers the data already available several days ahead. Those data could help ARPs in their estimation of the probability that the strategic reserve could be activated in the upcoming days.
- The "Getting ready" section gathers the data available one day before an activation of the strategic reserve. At this moment, the Economic and/or Technical Trigger can be activated (or not) giving a more accurate information about the probability of an SR activation the next day. Especially during SR activations, the ARPs have to prepare themselves to be as much as possible in a balanced position.
- The "Real-time Management" section gathers all data that are crucial for ARPs during the event of an SR activation. Basically, the real-time status of the SR activation as well as the cross-border situation and the balancing situation.

The same structure is followed in the annex section for published information not directly related to the SR but that still might help ARPs to prepare themselves to SR activations.

1 See www.winterklaar.be - www.pretpourlhiver.be - www.readyforwinter.be

1. ANTICIPATION

Understanding the Strategic Reserve

General information about the SR mechanism can be found on the Elia website under the page **"Strategic Reserves Implementation Task Force"**. Information about the agenda of the Task Force for the winter 2015-2016 and the legal calendar for the coming winter 2014-2015 can be consulted. Two important documents can also be downloaded in this section:

- the **"Functioning Rules of strategic reserves"** (further referred to as "Functioning Rules") including, among others, the indicators that are taken into account to detect a shortage situation and the principles related to the activation by Elia of the strategic reserve.
- the **"Procedure for Constitution of strategic reserves"** explaining the modalities of the procedure for constitution of the strategic reserve.

2. GETTING READY

Strategic Reserve submenu

In the menu "Grid Data", there will be a submenu "Strategic Reserve". There you can find the following subparts:

- User Guide
- SR Status Activation
- RSS Feed
- iSR TaskForce
- SR Capacity

The **"RSS Feed"** (Grid Data > Strategic Reserve > RSS Feed) for strategic reserve webpage shows text messages describing the current situation of the SR mechanism. Anybody can register for free to the flow and receive warning mails each time a new feed is created on this webpage.

The **"SR Capacity"** (Grid Data > Strategic Reserve > SR Capacity) section shows a table with two important data:

- **SR Capacity Day Ahead** (MW per H): The total strategic reserves available that can be sold on Belpex Day Ahead in case of an Economic Trigger which is equal to the volume of SGR available[2];
- **Economic Trigger volume** (MW per H): Effective volume sold on Belpex after an Economical Trigger occurrence.

Time	Strategic Reserve Capacity (MW) - SGR	Strategic Reserve Sold on Belpex (MW)
00:00 - 01:00	700 MW	50 MW
01:00 - 02:00	600 MW	100 MW

The **"SR Status Activation"** (Grid Data > Strategic Reserve > SR Status Activation) webpage shows visually what is explained in the RSS Feed for SR. There is a first section with real-time information with the different statuses placed in a chronological order from left to right:

- Detection
- Notification
- Verification
- Delivery
- Stop

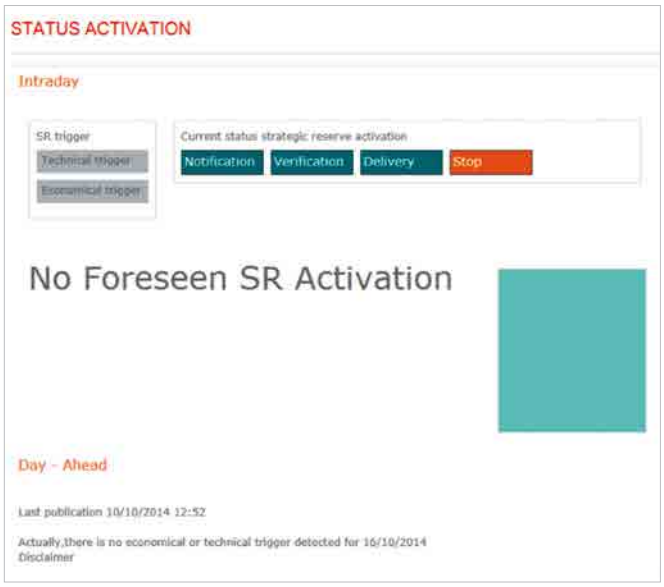
To avoid any confusion, please note that for a given SR activation we often make reference to:

- the Detection gate (moment when an Economic and/or a Technical Trigger is detected),
- the Notification gate (start of the warm-up period),
- the Verification gate (start of the ramp-up period),
- the start of the Delivery period (end of the ramp-up period and start of the period during which the SR should deliver the required SGR/SDR)
- the activation Stop (the moment when the SR activation is finished or stopped earlier than foreseen).

2 Prior to the day-ahead market coupling, Elia informs Belpex on the total available volumes of SGR per hour for the next day. The contracted SR suppliers inform Elia on their available volume (based on the Pmax Available that the SGR providers sent to Elia each day according to CIPU procedures) in a DA basis: SGR available volumes are notified to Elia prior to the day-ahead market coupling while SDR available volumes are known by Elia only after the Belpex day-ahead market coupling closing and are thus not taken into account by Belpex for the volume at disposal of the SRM market segment.

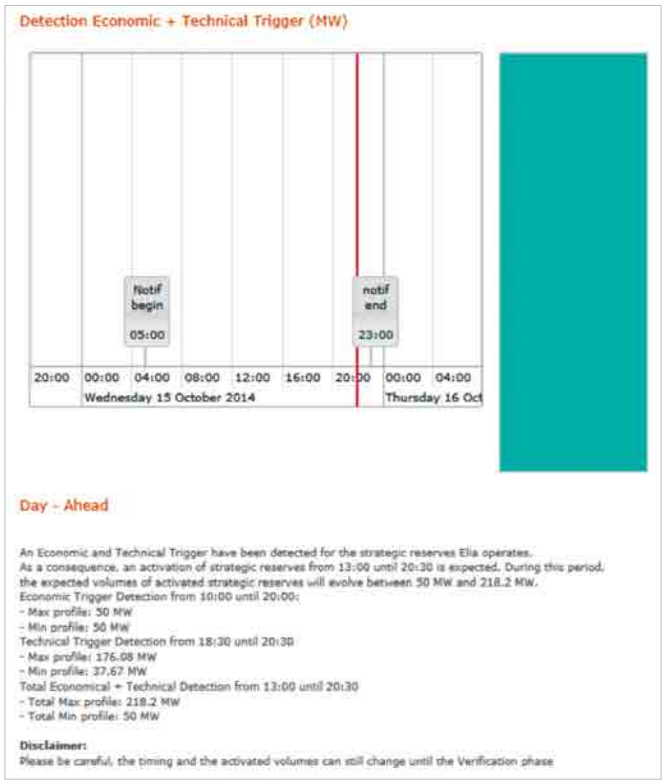
In this section, we only explain the Detection gate. For more explanation about the other SR statuses please see section "Real-Time Management".

Hereunder we show an example of the content of the SR Status Activation page when the warm-up period has been stopped. The first part of the page shows the intraday situation (see Real-Time section for more information), the second part shows if there is an Economic and/or a Technical Trigger activated.



In case of an actual Economic and/or Technical Trigger activation, the expected timing and activated SR volumes are also communicated. **Please be careful when interpreting the expected timing and activated volumes.** Those values are best estimates that Elia calculates in day-ahead. The values will become more accurate when approaching the SR delivery time. The picture hereunder shows how it will be presented on the Elia's website. Hereunder there is an example of the content of the SR Status Activation page in case of an Economic and Technical Trigger detection.

The **Economic Trigger** (see §6.4.1 of the Functioning Rules) is activated when a risk of structural shortage[3] has been detected on the Belpex DAM (Day Ahead Market). In other words if the total volume of electrical energy offer is not sufficient to cover the total volume of electrical energy demand expressed in terms of Limited Offtake Order at the Maximum Order Price on the market as explained in the Belpex Market Rules[4].


Detection Economic + Technical Trigger (MW)
Notif begin
05:00
notif end
23:00
20:00
00:00
04:00
08:00
12:00
16:00
20:00
00:00
04:00
Wednesday 15 October 2014
Thursday 16 Oct
Day - Ahead
An Economic and Technical Trigger have been detected for the strategic reserves Elia operates.
As a consequence, an activation of strategic reserves from 13:00 until 20:30 is expected. During this period,
the expected volumes of activated strategic reserves will evolve between 50 MW and 218.2 MW.
Economic Trigger Detection from 10:00 until 20:00:
- Max profile: 50 MW
- Min profile: 50 MW
Technical Trigger Detection from 18:30 until 20:30
- Max profile: 176.08 MW
- Min profile: 37.67 MW
Total Economical + Technical Detection from 13:00 until 20:30
- Total Max profile: 218.2 MW
- Total Min profile: 50 MW
Disclaimer:
Please be careful, the timing and the activated volumes can still change until the Verification phase

In this case, Belpex will offer an additional volume coming from the Strategic Reserve of Elia in order to meet the demand on the Belpex DAM. If the additional volume is not sufficient to meet the demand on the Belpex SRM Market Segment, the SR volumes will be spread pro-rata among the demand bids. Afterwards Elia will publish the following message on the RSS feed with the following text:

"An Economic Trigger has been detected for the strategic reserve Elia operates. As a consequence, a need for strategic reserve from DD/MM/YYYY hh:mm:ss until DD/MM/YYYY hh:mm:ss is expected. During this period, the strategic reserve will be activated in order to cover the needed volumes which are expected to vary between XXX MW and XXX MW.

Disclaimer: Please be careful, the timing and volumes mentioned here are only those that have been identified on Belpex (Economic Trigger only). The timing and the effective activated volumes can still change until the Verification gate. One economic trigger can cause several activations of strategic reserve."

3 Structural shortage of the zone: situation during which the total consumption level of the coupling zone cannot be covered by the offer of installed production in the Belgium grid, excluding the contracted Balancing Reserves, including the importation possibilities and the energy available on the market (defined in Electricity Act, art; 2,54°).
4 See www.belpex.be

The **Technical Trigger** (see §6.4.2 of the Functioning Rules) is activated in day ahead or in real-time when Elia identifies, based on its own analyses, a risk of structural shortage on the system. The indicators regarding the status of the system that are used for the detection of a risk of structural shortage as well as how an alarm of a risk of structural shortage is triggered are described in the Functioning Rules.

When a Technical trigger is detected, the following message in the RSS feed is published:
"A Technical Trigger has been detected for the strategic reserve Elia operates. As a consequence, a need for the strategic reserve from DD/MM/YYYY hh:mm:ss until DD/MM/YYYY hh:mm:ss is expected. During this period, the strategic reserve will be activated in order to cover the needed volumes which are expected to vary between XXX MW and XXX MW.

Disclaimer: Please be careful, the timing and the actual activated volumes can still change until the Verification gate. One technical trigger can cause several activations of strategic reserve."

Elia Grid Available Regulation Capacity (ARC)

Elia publishes on its website the **available regulating volumes that can be activated to offset imbalances and the marginal prices of the bids for activating those volumes**. Those data are published at 8 pm on the day ahead and can be updated in intraday. If there is a strategic reserve volume activated that is bigger than 0 MW[5], and there is no structural shortage, then the (downwards or upwards) imbalance prices (POS or NEG) will be equal to the prices showed in the table "bidding prices per volume level" (see hereunder).

Depending on the level of the NRV, the imbalance price will be the value showed in the table for the corresponding column. For example, a NRV of 345 MW between 00:45 and 1:00 will mean an activation between 300 MW and 600 MW. As a consequence, the imbalance price will be 105.39 €/MWh (i.e. the one corresponding the maximum activation volume of the category [300 MW to 600 MW]).

	Marginal prices (€/MWh) for activation of							
Quarter	-Max	-600 MW	-300 MW	-100 MW	100 MW	300 MW	600 MW	Max
00:00 > 00:15	-251.50	1.20	6.65	6.65	72.55	72.55	315.00	341.26
00:15 > 00:30	-251.50	1.20	6.65	6.65	72.55	72.55	160.50	341.26
00:30 > 00:45	-251.50	1.20	6.65	6.65	72.55	72.55	160.50	341.26
00:45 > 01:00	-251.50	1.20	6.65	6.65	72.55	72.55	105.39	341.26
01:00 > 01:15	-251.50	-251.50	7.52	7.52	72.77	72.77	72.77	337.88

The same data is available under the form of a graph as shown hereunder.

5 This can also be in situations like a test of SR activation or of a Warm-up period.

3. REAL-TIME MANAGEMENT

Activation Warnings

Elia provides two pages on its website in order to share as quickly as possible (close to real-time) with the ARPs the activation status of the Strategic Reserve from the Economic and/or Technical Triggers to the end of an eventual activation.

The **"RSS Feed"** (Grid Data > Strategic Reserve > RSS Feed) for strategic reserve webpage shows text messages describing the current situation of the SR mechanism. Anybody can register to this flow and receive warning mails each time a new feed is created on this webpage.

The **"SR Status Activation"** (Grid Data > Strategic Reserve > SR Status Activation) webpage shows visually what is explained in the RSS Feed for SR. There is a first section with intraday information with the different statuses placed in a chronological order from left to right:

- Detection
- Notification
- Verification
- Delivery
- Stop

The different activation steps take into account the necessary delays for the SGR and SDR suppliers to get ready for injection/curtailment while still allowing Elia to keep some flexibility (cancellation, delay of the activation, etc.) as long as possible before the delivery period. Please read carefully the §6.2.2 and §6.3.2 of the Functioning Rules of SR for more detail.

- **The period between a detection and the Notification gate** is described in the section "Getting ready" because this indicator can already appear in day-ahead and it corresponds to the Economic and Technical Triggers.
- **The warm-up period.** Between the detection and the Notification gate, Elia selects the suppliers to be activated (see §6.5 Functioning Rules). When selected SGR and SDR suppliers receive a notification from Elia with the volumes they will have to activate as well as the timing of activations. The RSS feed gives the end and begin time of the warm-up period of the first supplier. However after this first notification, Elia can choose to prolong the warm-up period or to cancel it. The warm-up period will only start at the time announced in the RSS feed message or when the status activation changes. For more information about the Notification gate, please consult § 6.4.3 of the Functioning Rules. The status activation will be in "notification" status, when at least one SGR or SDR unit is in the warm-up period. The following message will appear in the RSS feed to announce the Notification gate:

"The Notification gate (i.e. start of the warm-up period) has been reached for at least one of the selected Strategic Reserve suppliers. This warm-up period will run from DD/MM/YYYY hh:mm:ss and DD/MM/YYYY hh:mm:ss.

Disclaimer: Please be careful, as long as there is no actual verification warning or STOP message, the warm-up period will continue and might be prolonged. It can also be decided that the Delivery is not needed and that the warm-up period must be stopped."

- **The ramp-up period** starts when the selected SDR/SGR units have finished the warm-up preparations. When the ramp-up period starts, it means that the need is confirmed and that the **SGR units** can continue the ramp-up towards their Pmin injection level and the **SDR units** can continue the ramp-down towards their shedding limit. From this moment on, the injection/curtailment is confirmed. For more information about the ramp-up period, please consult §6.4.3 of the Functioning Rules. The status activation will be in "verification" status, when at least one SGR or SDR unit is in the ramp-up period. The following message will appear in the RSS feed to announce the Verification gate:

  "The Verification gate (i.e. start of the ramp-up period) has been reached for the strategic reserve Elia operates. This means that the injection/curtailment of the activated volumes of the strategic reserve is now confirmed. The selected SGR and SDR suppliers will follow their activation program from DD/MM/YYYY hh:mm:ss until DD/MM/YYYY hh:mm:ss. During the Delivery period, the expected volumes of the activated strategic reserve will evolve between XXX MW and XXX MW.

  Disclaimer: Please be careful, the Delivery period should start at the end of the ramp-up period but it is still possible to stop the SR activation before the start of the Delivery period or to change the activated volume and the end time of the Delivery period."

- **The Delivery period.** When the activation enters the start of the Delivery period, the SDR and SGR units should have reached their target levels. The status activation will be in "Delivery" status, when at least one SGR or SDR unit is in the Delivery period. The following message will be displayed in the RSS Feed to announce the Delivery period:

  "The Delivery period has been reached for the strategic reserve Elia operates. The selected providers will follow their strategic reserve activation program from DD/MM/YYYY hh:mm:ss until DD/MM/YYYY hh:mm:ss. During this period, the activated volumes of the strategic reserve will evolve between XXX MW and XXX MW.

  Disclaimer: Please be careful, the Delivery period can still be stopped or the activated volumes changed at any moment by Elia if the activated volumes do not fit with the actual need."

- **The Activation Stop** means that the SR activation has been stopped. This will be shown in the SR status activation and in a message in the RSS feed.

  "The Delivery period of the strategic reserve has been stopped by Elia at DD/MM/YYYY hh:mm:ss. As a consequence, no more activations of the strategic reserve are foreseen from DD/MM/YYYY hh:mm:ss until DD/MM/YYYY hh:mm:ss.

  Disclaimer: Please continue to follow carefully the RSS Feed because other SR activations are still possible."

Important notice: The tariff of 4500 €/MWh can only be reached during the ramp-up period and the Delivery period!

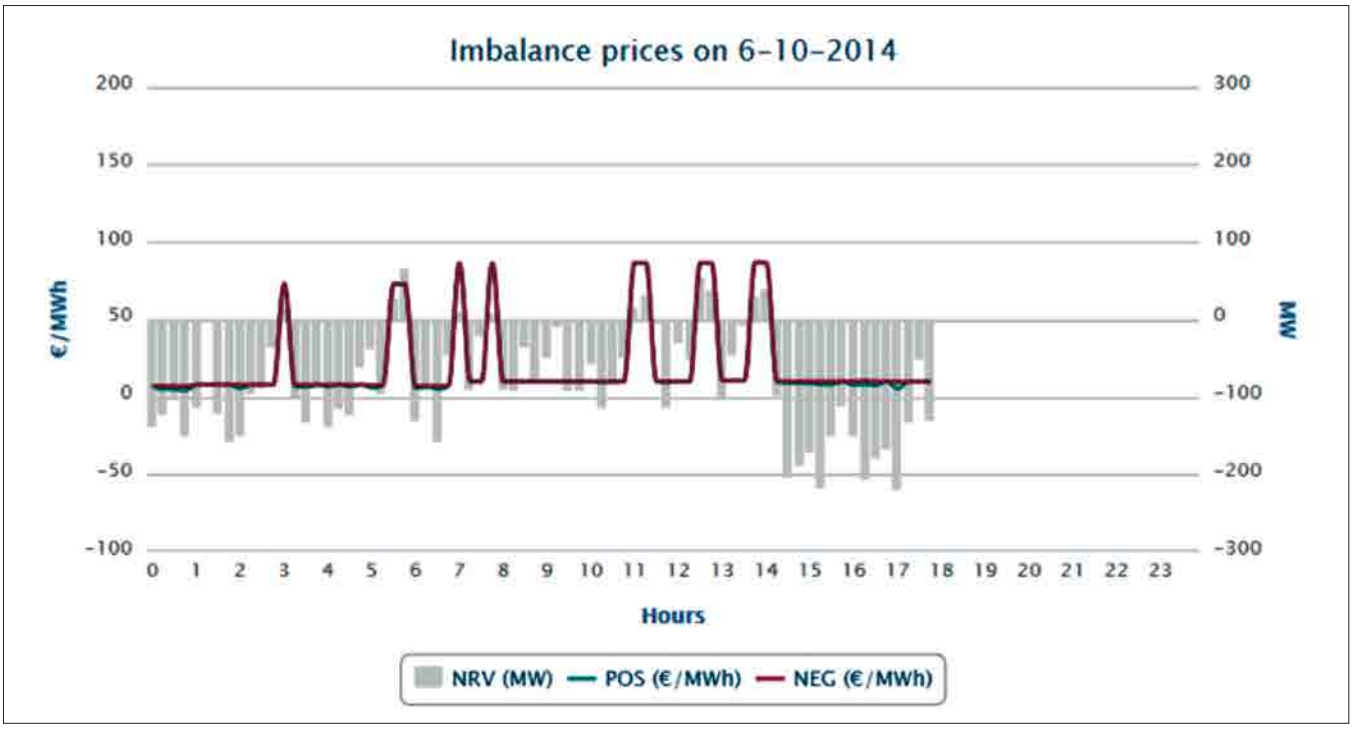
Elia Grid Balancing Situation

To follow the balancing situation on the Elia Grid is crucial for ARPs during any SR activation. Indeed, the imbalance prices might sharply increase during the activation period (see §6.7.1 of the Functioning Rules to better understand the importance of the balancing prices mechanism).

In order to help the ARPs to take this parameter into account, Elia publishes on its website:

- The current **System Imbalance (SI) as well as the current Net Regulation Volume (NRV)** on its website. Those data are refreshed every 2 minutes and can be downloaded by any user (Grid Data > Balancing > Using Regulation Capacity for the NRV values and Grid Data > Balancing > Imbalance Prices for the SI). The volumes of energy injected in the Belgian coupling zone by a SR unit will be counted in the NRV calculus except for the volumes supplied on the Belpex SRM. Please consult §6.6 of the Functioning Rules for more detail.
- The **RSS Feed** (Grid Data > Strategic Reserve > RSS Feed) section for the balancing warnings. Anybody can register to this flow and receive warning mails each time a new feed is created on this webpage. This is a separate RSS feed from the Strategic Reserves warnings.
- The **Available Regulation Capacity (ARC)** showing the volumes that can be activated to offset imbalances and the marginal prices for activating those volumes. See "Getting Ready" section for more information.
- The **Using Regulation Capacity (URC)** showing the activated regulation volumes and the prices for activating those volumes. On top of that, the activated SR volumes as well as the SR prices are displayed in the tables. To understand how those imbalances prices are calculated during a SR activation, please consult § 6.7.2 of the Functioning Rules.

  Important disclaimer: When the strategic reserve volume that is activated is bigger than 0 MW, the imbalance tariffs calculus is adapted accordingly. This means that in the prices table the columns MIP, IGCC+, R2+, Bids+, R3+, MDP, IGCC-, R2- and Bids- will not be used for the calculation of the imbalance prices, when a activation of strategic reserve is on-going. The imbalance price will be in the column with the SR Price.
- The **Imbalance prices** (for upwards and downwards regulation) per quarter hour for the current day are displayed on a graph (see hereunder). The Net Regulation Value (NRV) is showed on the same graph.



Under this graph, the same data can be consulted under the form of a table (see hereunder for an example).The data can be consulted on the same page on the table below the graph from the webpage and in the column in parallel with the NRV and can be downloaded from the Elia's website. The two columns on the right of this table shows the upwards and downwards imbalance price per quarter of an hour.

Quarter	NRV (MW)	SI (MW)	α (€/MWh)	MIP (€/MWh)	MDP (€/MWh)	POS (€/MWh)	NEG (€/MWh)
00:00 > 00:15	-39,181	-74,956	0,00	79,11	**4,22**	4,22	4,22
00:15 > 00:30	-79,509	98,031	0,00	79,36	**4,64**	4,64	4,64
00:30 > 00:45	-78,848	64,574	0,00	0,00	**4,64**	4,64	4,64
00:45 > 01:00	-9,429	-15,387	0,00	79,12	**4,37**	4,37	4,37
01:00 > 01:15	97,610	-198,253	1,00	**85,28**	0,00	85,28	86,28
01:15 > 01:30	23,055	-1,164	0,00	**85,28**	6,09	85,28	85,28
01:30 > 01:45	-13,016	0,159	0,00	85,29	**6,09**	6,09	6,09

Important disclaimer: When the strategic reserve volume that is activated is bigger than 0 MW, the imbalance tariffs calculus is adapted accordingly. This means that the columns alpha, MIP and MDP are not used for the calculation of the imbalance prices (POS and NEG), when a activation of strategic reserve is on-going and the activated volume is bigger than 0 MW. The imbalance prices (POS and NEG) can either reach €4.500/MWh or be calculated based on the available reserve capacity prices (see below section: "Elia Grid Available Regulation Capacity (ARC)"). To understand the exact formula behind the calculus of the imbalance prices please consult §6.7.2 of the Functioning Rules.

4. ANNEXES

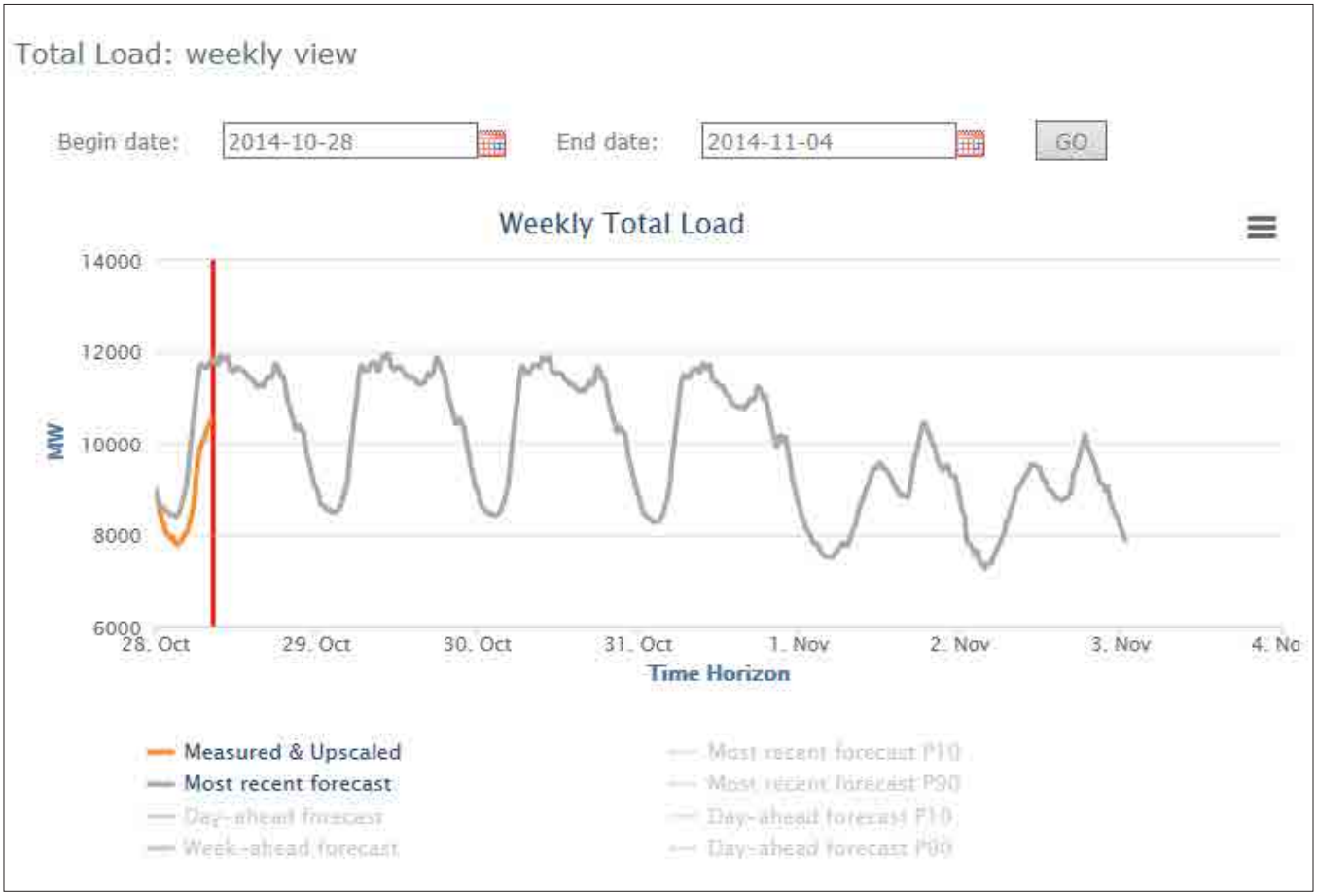
4.1 Anticipation

ELIA GRID WEEK AHEAD LOAD FORECASTS

Elia publishes week ahead Total load forecasts on its website. This information can be consulted on the following webpage. The total load incorporates all electrical loads on the Elia grid and in underlying distribution networks (and also includes electrical losses). It is estimated based on a combination of measurements and upscaled values of injections of power plants, including generation in the distribution networks, to which imports are added. Subsequently, exports and power used for energy storage are deducted, leading to an estimation of the actual total load in the Elia-grid and all underlying networks. Please note that the Elia-grid comprises networks of at least 30 kV in Belgium plus the Sotel/Twinerg grid in the south of Luxembourg.

The published Elia grid load forecast is purely informational as large deviations can occur on days with varying output levels of decentralized generation.

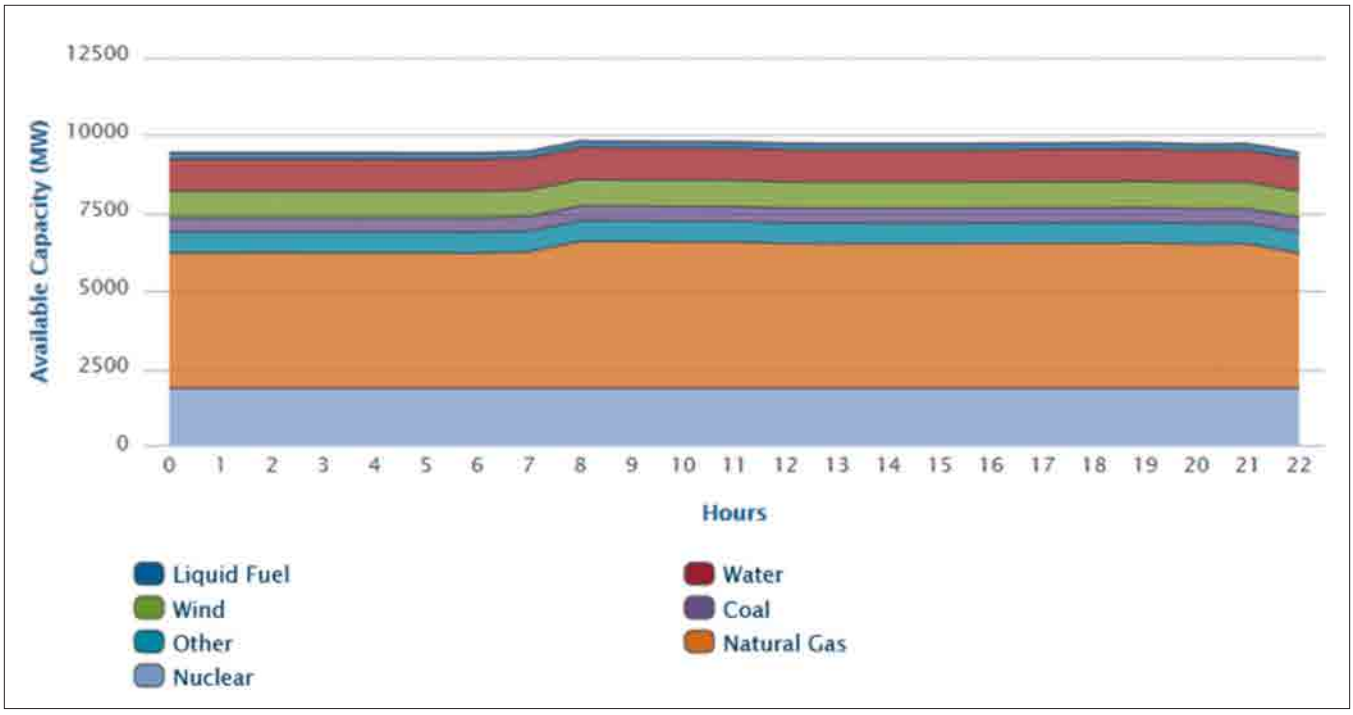
Hereunder, a screenshot is shown of the weekly forecast of a given day. You can navigate on the forecasted week by selecting the begin and end dates on top of the graph.



ELIA GRID GENERATION CAPACITY FORECASTS

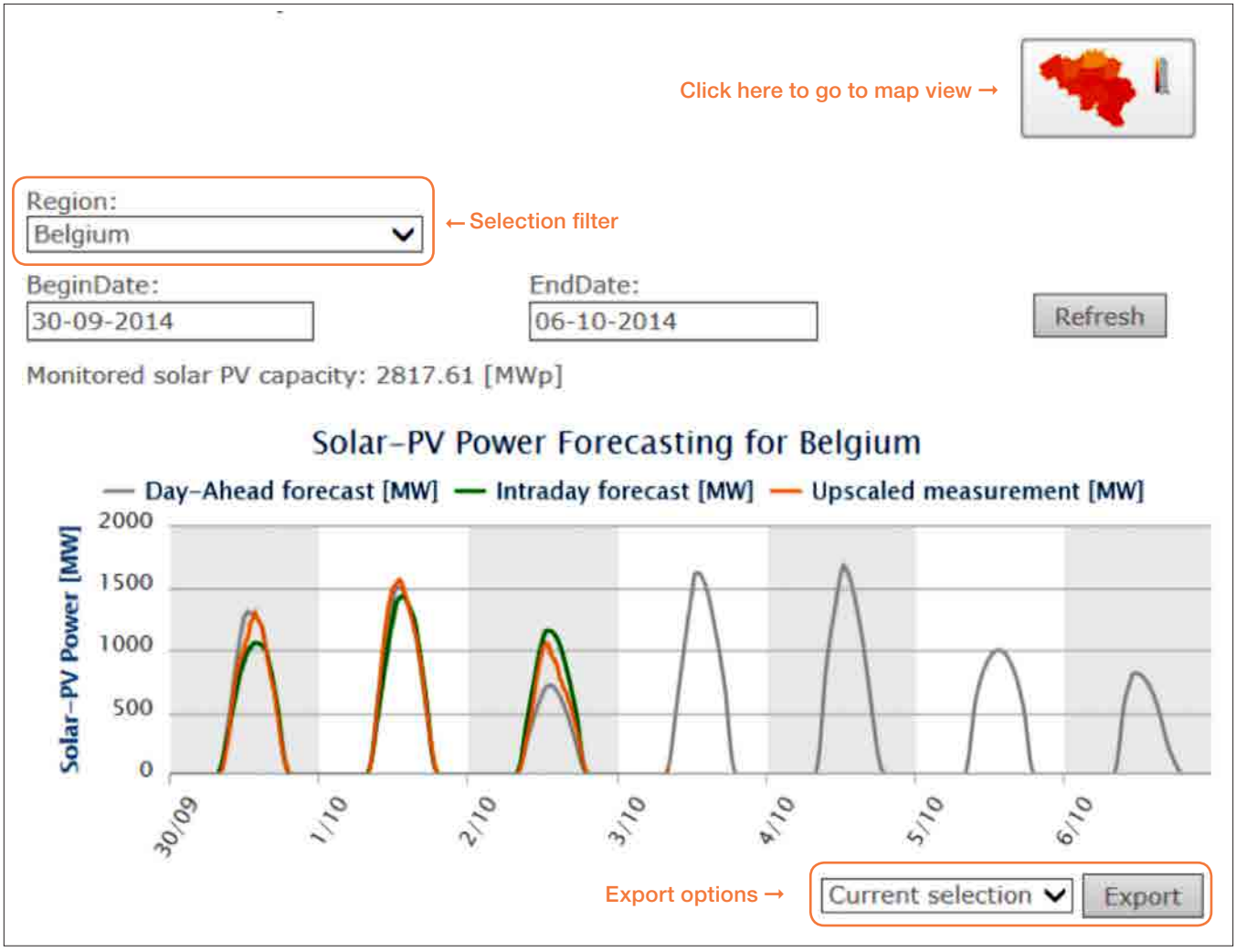
Elia publishes the available hourly generation capacity of facilities with a CIPU contract on its website. This information can be consulted on the following webpage. This forecast covers a period extending from one day ahead to the end of the current year. The forecast of the current day is represented graphically, per fuel type, on the webpage (see picture hereunder). To consult the forecasts for the next days, an excel file can be downloaded from a link situated on the webpage under this graph. The available generation capacity forecasts for CIPU units with more than 100 MW capacity can also be consulted on this webpage.

Elia also publishes an overview of planned and unplanned outages of generation units with a nominal power greater than 100 MW. This information can be consulted on the following webpage.



ELIA GRID RENEWABLE GENERATION FORECASTS

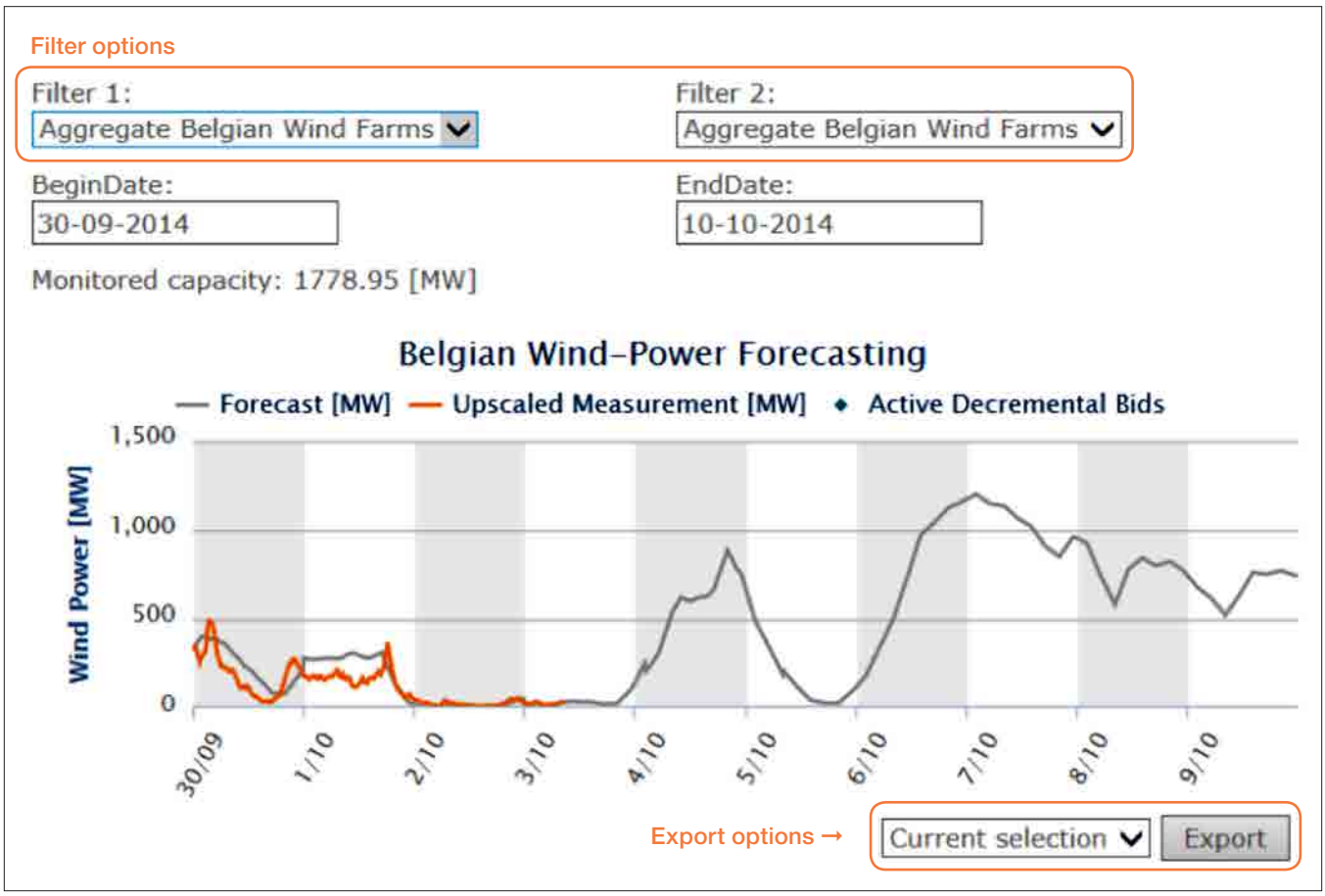
Elia publishes on its website the wind and solar power generation forecasts. The wind power generation forecasts can be consulted on the following webpage while the solar power generation forecasts can be consulted on the following webpage.
For solar power generation, the webpage shows an aggregate forecast of the PV-solar power generation for today up until the **next three days**. Using the selection filter the latter will vary according to the geographic region selected (provincial, regional or country level). The picture hereunder shows how the graph is represented on the website. Here you can find more about the hypotheses taken to build these forecasts.



For wind power generation, the webpage shows an aggregate forecast of the wind power generation for the **next seven days**. This varies depending on the selected filter (filter 1: onshore vs. offshore wind farms; filter 2: wind farms connected to Elia vs. DSO). The picture hereunder shows how the graph is represented on the website. Here you can find more about the hypotheses taken to build these forecasts.

ELIA GRID CROSS-BORDER CAPACITY FORECASTS

Elia publishes on its website the week ahead border capacity between France and Belgium and between The Netherlands and Belgium. To understand how those values are calculated, please visit the following page.



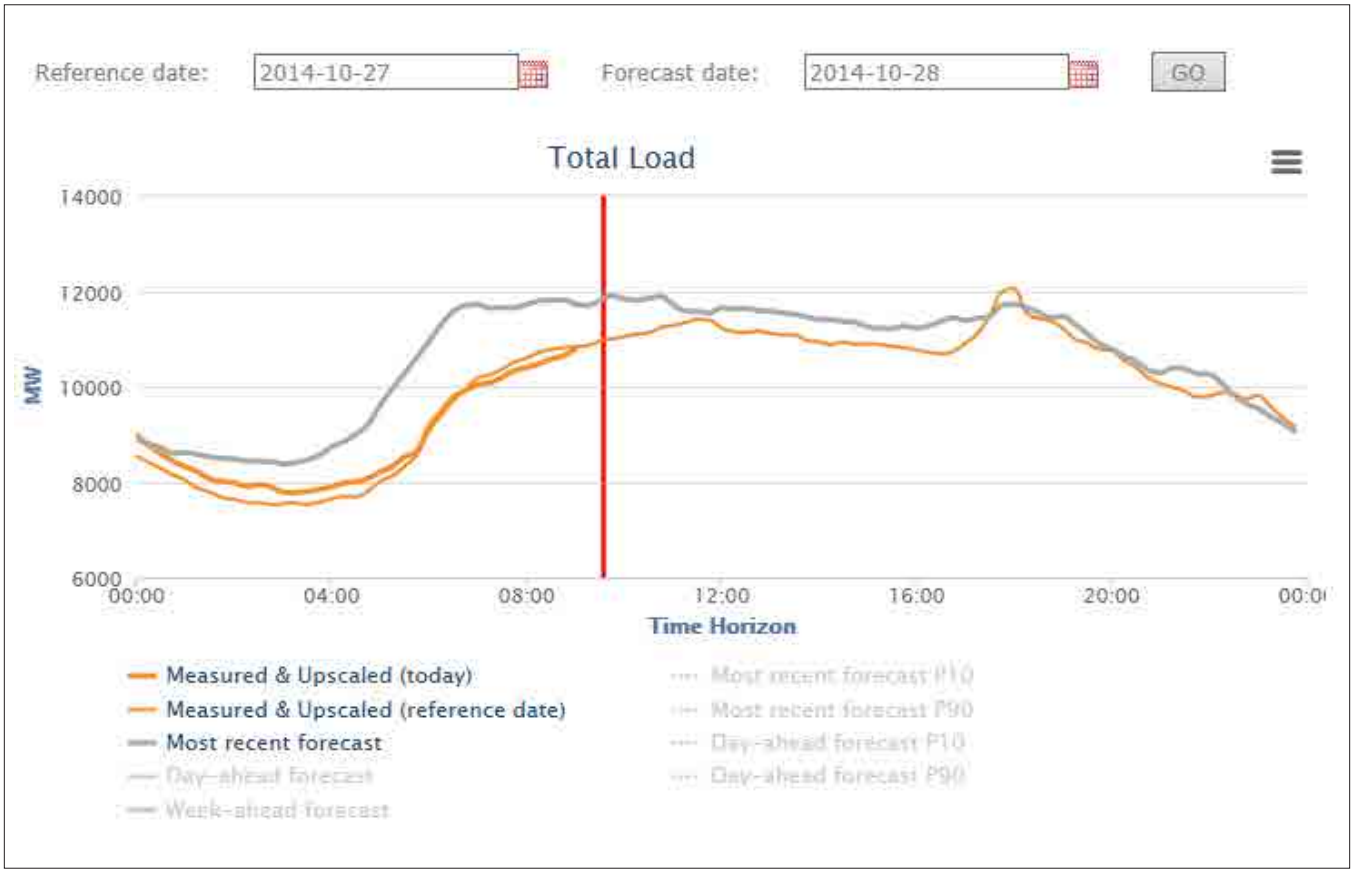
4.2 Getting ready

ELIA GRID DAY-AHEAD LOAD FORECASTS

Elia publishes Day-Ahead Total load forecasts on its website. This information can be consulted on the following webpage. The total load incorporates all electrical loads on the Elia grid and in underlying distribution networks (and also includes electrical losses). It is estimated based on a combination of measurements and upscaled values of injections of power plants, including generation in the distribution networks, to which imports are added. Subsequently, exports and power used for energy storage are deducted, leading to an estimation of the actual total load in the Elia-grid and all underlying networks. Note that, the Elia-grid comprises networks of at least 30 kV in Belgium plus the Sotel/Twinerg grid in the south of Luxembourg.

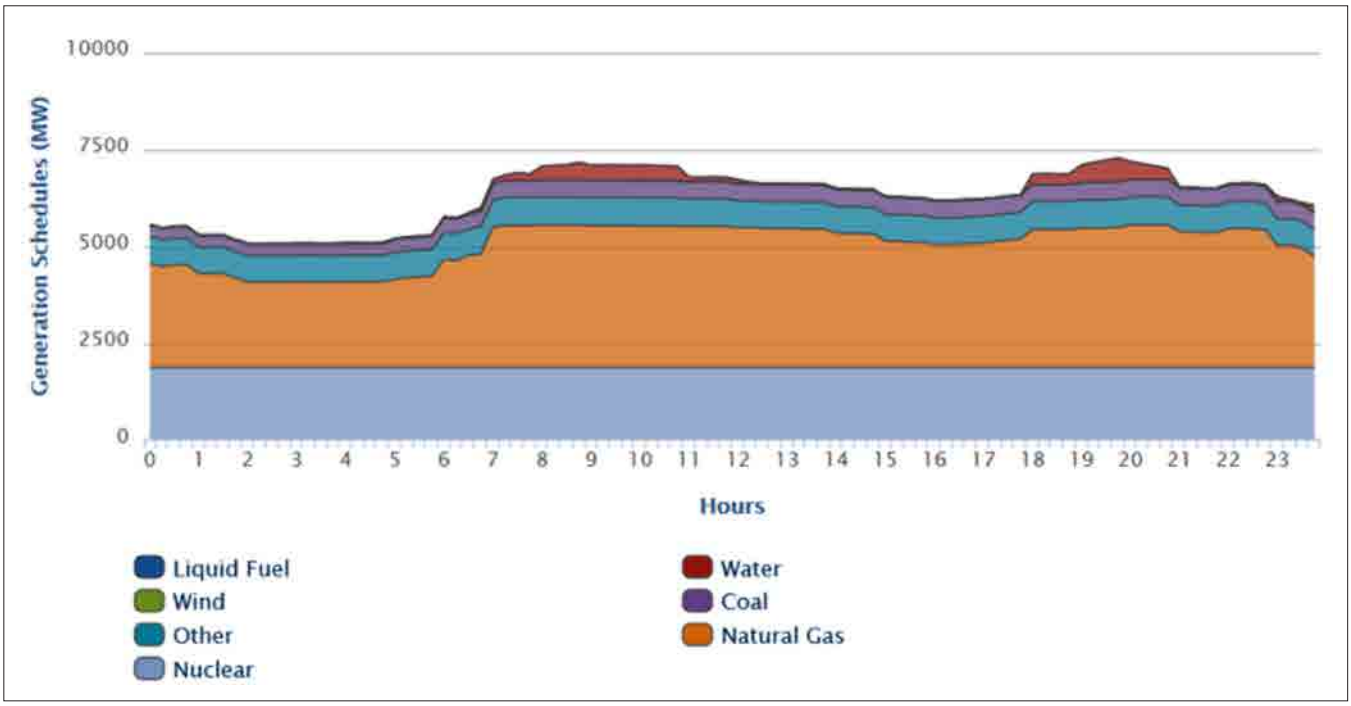
The published Elia-grid load forecast is therefore purely informational as large deviations can occur on days with varying output levels of decentralized generation.

Hereunder, is shown a screenshot of the day-ahead forecast of a given day. The chart shows an estimation of the total load for today in real-time (bold orange curve), that can be compared with the measured & upscaled total load for the specified reference date (orange curve), and with the forecasts for the specified forecast date (up to six days ahead).



ELIA GRID GENERATION SCHEDULE

Elia publishes on its website information on the values of the generation schedules submitted one day in advance by ARPs. The values are based on ARPs' generation unit nominations (by fuel type). Hereunder, you can see a picture showing how it is represented on the webpage. It is also possible to download the quarter-hourly data from a link situated at the end of the webpage.



ELIA GRID DAY-AHEAD RENEWABLE FORECASTS

Elia publishes on its website the wind and solar power generation forecasts. The wind power generation forecasts can be consulted on the following webpage while the solar power generation forecasts can be consulted on the following webpage. For more detail about those pages, please consult Elia Grid Renewable Generation Forecasts section.

ELIA GRID NOMINATED CROSS-BORDER CAPACITY

Elia publishes on its website the day-ahead total cross-border nominated capacity as well as the split of the cross-border nominated capacity between France and Belgium and between The Netherlands and Belgium. The nominated values correspond to the cross-border capacity that has already been bought on the market while the daily cross-border capacities (France-Belgium and The Netherlands-Belgium) show the maximum available cross-border capacity. The difference between the maximum available and the nominated capacities give the remaining cross-border capacities.

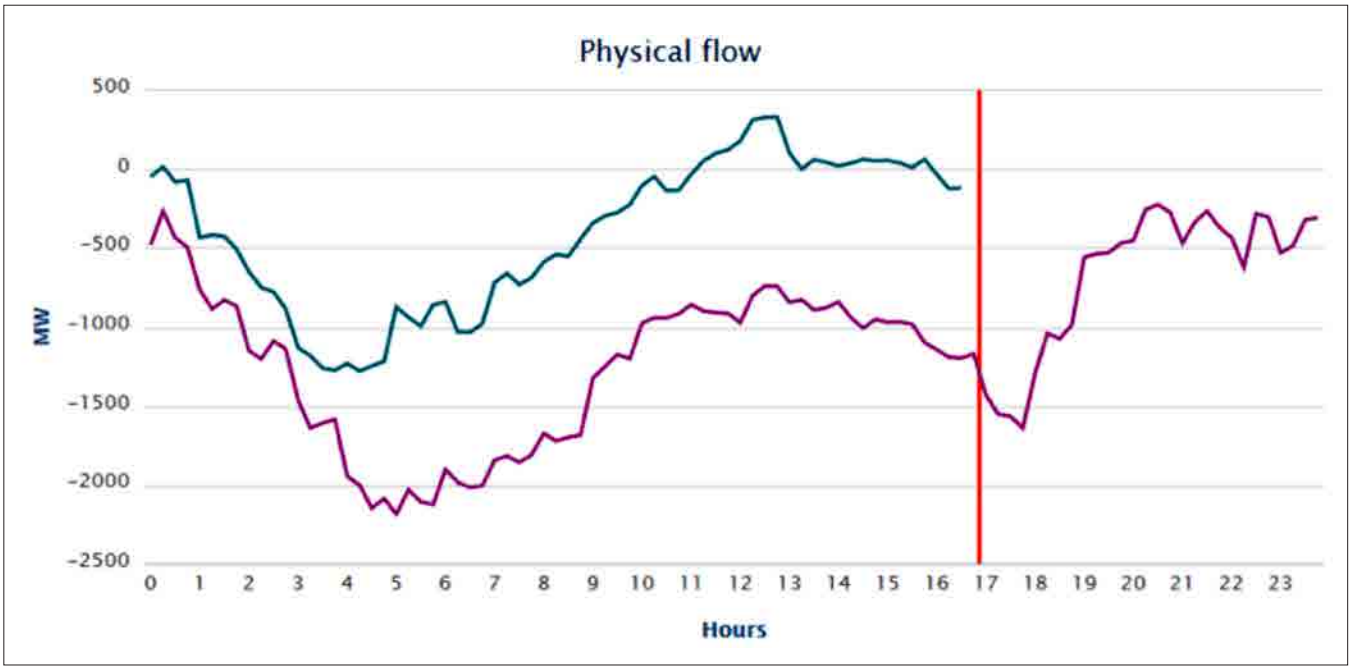
To understand how those values are calculated, please visit the following page.

4.3 Real-time Management

ELIA GRID CROSS-BORDER PHYSICAL FLOWS

Elia publishes the real-time exchanges of energy, observed at borders. Those cross-border physical flows are distinguished from commercial flows, which correspond to the exchange programs (nominated capacity) scheduled by market players using cross-border mechanisms.

Hereunder is shown a screenshot of the physical flows between France and Belgium of the previous day (pink line) and the physical flows of the current day (green line) for a given day. The same information can be consulted on the same page for the border between Belgium and The Netherlands as well as the import/export balance of Belgium.



Elia publishes also the intraday cross-border capacity for energy exchanges between Belgium and France and between Belgium and The Netherlands. Hereunder is shown a screenshot of the intraday capacity made available by netting for flows going from France to Belgium.